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Memorandum

Confidential Attorney/Client Privileged Communication

October 9, 1997

B.D. Farmer

Re: *Tailings Impoundment - S.E. Corner Seismic Instability Review*

You have requested a legal review and analysis of potential liabilities associated with the seismic instability of the southeast corner of the tailings impoundment. The analyses and recommendations set forth herein are based on an extensive review of company records and interviews of numerous technical experts, lawyers and managers involved, since 1988, in risk assessment and mitigation efforts pertaining to the Southeast Corner of the tailings impoundment (hereafter referred to as the "Magna Corner").

This report assumes the Magna Corner meets or exceeds the 1.3 Minimum Factor of Safety under Section R655-11-6A of the Utah Administrative Code, pertaining to static failures of water retention structures. This assumption is based on assurances received from the Tailings Modernization Project Manager and other technical experts employed by KUCC. This report does not cover any risks associated with static or dynamic instability of the tailings impoundment in areas other than the Magna Corner, and more particularly, in the Northeast Corner which is included within the on-going modernization project.

Factual Background

The tailings impoundment has been in operation since approximately 1906, and has incurred at least two failures, in 1941 and 1964. Neither failure was seismically induced, and there was no loss of life or significant property damage other than that inflicted upon the impoundment structure itself, App. A. These static failures were apparently related to the deposition of fine particle tailings which, due to water intrusion, became fluid, resulting in embankment failure. The breaches in the impoundment structure were repaired, in due course, by construction of internal dikes using gravel materials from local borrow sources.

The tailings impoundment is located within the southern portion of the Intermountain seismic belt, a major zone of seismicity in the western United States. The most

severe historic earthquakes within the Intermountain seismic belt have been the 1959 Heben Lake, Montana 7.3 event, and the 1983 Borah Peak, Idaho 6.8 event. A total of 16 earthquakes have exceeded a magnitude of 6 on the Mercalli Scale within the Intermountain seismic belt since 1850. App. B. The only recorded earthquake, of significant magnitude, in the vicinity of the tailings impoundment, occurred in 1962 and registered 5.2 on the Richter Scale. The epicenter was near the Magna Corner, but did not result in any noticeable impairment to the tailings impoundment structure. App. C.

The susceptibility of the tailings impoundment to dynamic failure was considered as early as 1957 in a report authored by Arthur Casarande (known as the "father of soil mechanics") wherein he stated "it is, of course not possible to give the fine mine tailings a clean bill of health under the effects of violent earthquakes." A 1966 report by Woodward-Clyde concluded that "there is substantial risk of tailings dam failure from earthquakes, within the planned life of the disposal system." A 1974 report by W.A. Wahler and Associates indicated a "very high susceptibility to liquefaction," and recommended future research into "the response of the dam under dynamic loading conditions." And, in 1983, a Dames and Moore geotechnical report again raised the issue of a possible dynamic failure of the impoundment.

Due to the encroachment of communities and infrastructure in the vicinity of the impoundment, Kennecott's management decided to commission a definitive geotechnical study in the late 1980's to ascertain the risk of seismic failure and appropriate mitigation measures. The initial geotechnical evaluation was issued in 1988 by Kloth Leonoff (KL), an engineering firm based in Canada.

Kloth Leonoff Studies: The 1988 KL study employed "state of the art" techniques and methodology to examine the risk associated with a dynamic failure of the tailings impoundment. KL concluded, on the basis of a 7.5 magnitude earthquake, that there was a 6% risk of impoundment failure at the Magna Corner within a 30 year period. The risk factor calculated by Kloth Leonoff exceeded the International Committee on Large Dams (ICOLD) standard by an entire order of magnitude. According to a recognized expert, H. Bolton Seed, who subsequently reviewed and validated the KL findings, "the annual risk of failure for the tailings deposit is about 2 orders of magnitude (i.e. 100 times greater) than for conventional dams." App. D.

Moreover, KL estimated, on the basis of the then existing embankment height of 160 feet, that the muddy tailings could flow one-half mile to the south (towards the town of Magna), three-quarters of a mile to the east, and one mile to the north. The zone of potential danger included inhabited areas, industrial sites, a major railroad line, and public highways. KL's conclusions prompted Mr. Frank Joklik, the former President of Kennecott Corporation, to establish a task force to ascertain appropriate mitigation measures, particularly with regard to reducing the risk of loss of life and serious bodily harm to the residents of Magna.

The task force undertook to examine numerous options for enhancing the stability of the Magna Corner and other portions of the tailings impoundment. Kennecott initiated a comprehensive data collection program around the perimeter of the tailings embankment, including the installation of piezometers and accelerometers. Beginning in approximately April 1989, Kennecott implemented a multi-million dollar dewatering program on the Magna corner which is still underway. The task force commissioned several additional studies from KL, including the "Reduction Study" which was completed on August 11, 1989. App. E.

In the Reduction Study, KL reviewed various remedial measures to reduce the possibility of failure, including drainage, slope improvement and berms. Significantly, KL opined "that it will not be possible to completely dewater the tailings using drainage, and it is therefore not possible to eliminate the possibility of liquefaction." Nor, in KL's judgment, could densification or internal step-backs "reduce P, [probability of failure] sufficiently to make the existing slope safe against liquefaction." KL concluded that an external berm was the only method which could significantly reduce the risk of failure on the Magna Corner:

Of those methods examined in this study, a berm on the existing slope ... appears to be the most effective in reducing P, provided that it is sized properly, designed and constructed adequately to resist liquefaction, and its foundations are not susceptible to liquefaction.

Based on this conclusion, Kennecott adopted a strategy, which it pursued from 1989 through 1993, to seismically upgrade the entire impoundment by expanding to the north while dewatering and constructing a berm on the south embankment. Ultimately, Kennecott commissioned and obtained the design of a seismic upgrade on the Magna Corner which included dewatering, construction of a major step-back and berm, creation of a substantial buffer, and installation of a deflection dike. App. F. The entire upgrade was estimated to cost approximately \$200 million, and to require nearly nine years for final completion.

For reasons which are not clearly articulated in company records, Kennecott abandoned several of the key elements of the seismic upgrade program upon the submission of an investment proposal in 1993. The proposal requested RTZ funding for the north expansion, but did not include the construction of a berm, establishment of a buffer, or installation of a deflector dike adjacent to the south embankment. However, the rationale for abandoning major components of the seismic upgrade recommended by KL can be inferred from a 1993 AFE justification requesting \$1.8 million to obtain additional dewatering data and analysis of the long-term benefits associated with the dewatering program:

The seismic upgrade berm alternative feasibility design is completed. This design incorporates a drained stabilizing berm constructed against

the existing embankment, in combination with an auxiliary berm to divert a potential failure away from adjacent built-up areas. Construction of the berms will require a nine year period after obtaining appropriate permitting and public interaction. The berm construction requires the relocation of an estimated 2.75 miles of State Route 201, all Kennecott Utah Copper and third party utilities in the proximity, realignment and modification of process water facilities and relocation of the Magna Copper Golf Course. *** Limited pumping tests, a detailed geotechnical site investigation and evaluation of the embankment and foundation engineering characteristics was conducted in early 1992 as part of the feasibility engineering effort. Analysis of this work indicates that a potentially more cost effective reduction than the stabilizing berm requirement may be possible through long term dewatering of the southeast corner embankment using vertical pumping wells. *** An additional cost benefit would be realized in providing additional construction material availability for the north expansion by the reduction of southeast corner material requirements.

App. G. This language suggests that Kennecott abandoned the berm alternative to avoid the high anticipated costs associated with seismically upgrading the Magna Corner pursuant to a buffer and barrier methodology. Management nevertheless had reason to believe, based on additional data compiled after completion of the KL Reduction Study, that a comprehensive and consistent dewatering program, utilizing vertical drains, coupled with step-backs at the Magna corner, could yield an appropriate margin of safety against liquefaction resulting from a seismic event.

The later conclusion is supported by KL's draft "Assessment of Vertical Pumping Wells" dated August 27, 1992. App. N. Relying on vertical well pumping tests conducted by Kennecott, KL assessed the impact of a 10 year dewatering effort on P_v , and concluded the risk could be reduced to 3.5% over 30 years, and potential runout limited to an area under 500 feet. These reductions would be achieved by altering the "failure mechanism, from a flow of liquefied mass to blocks riding on a basal liquefied zone." KL nevertheless opined that "dewatering alone will not prevent the Magna embankment from failing and flowing during a major earthquake," and a berm, albeit smaller in size, would still be necessary to seismically stabilize the Magna Corner.

Residential Acquisitions: Having reviewed the spill-out estimates provided by KL, Mr. Joklik authorized the KUCC Land Department to commence purchasing approximately 200 homes within the Meadow Green Estates Subdivision which were at risk of inundation in the event the impoundment failed at the Magna Corner. However, the Land Department was not expressly advised regarding the reasons for purchasing the homes, and management decided to conceal Kennecott's involvement in the transactions through the use of an undisclosed agent. During 1990 and 1991,

Kennecott purchased 39 homes in the Meadow Green Estates using an undisclosed agent. The undisclosed agent held title to the homes on behalf of Kennecott to avoid revealing the true, equitable owner in the public records. The Sellers were not informed of Kennecott's involvement or that their homes were in an area which KL had identified as being at risk of inundation.

In 1992, RTZ conducted a "risk assessment" pertaining to the inundation area identified in the KL Reduction Study. The assessment consisted of several questions, including without limitation, "approximate number of people involved ... approximate spread of the population age (normal, young, aged) ... approximate number of children and adults present at each school ... approximate value placed on loss of life by Utah courts, with variation by age." The Land Department was asked to assist in preparing Kennecott's responses to these questions. The record reflects an attempt to provide answers to some of the queries, but does not elaborate on RTZ's rationale for conducting such an assessment.

In 1991, the Land Department advised Kennecott's General Counsel that the 39 vacant homes were causing problems in the neighborhood due to vandalism and lack of maintenance. Counsel authorized the Land Department to rent the homes through the undisclosed agent. The tenants were not apprised of the risks associated with impoundment failure as identified in the KL studies. The Land Department subsequently was instructed "to discontinue any further purchase of homes within the Green Meadows Estate Subdivision." The Land Department nevertheless continued to purchase undeveloped buffer properties.

In 1995, management decided to sell the 39 homes to new owners, using the same undisclosed agent. Again, the purchasers were not advised of Kennecott's connection to the sale, or the risks associated with impoundment failure. Although the record does not reflect management's rationale for divesting the homes, Messrs. Pierce and Priano were involved in the decision. In interviews, they recollected having been advised that the risk of impoundment failure had been mitigated through the dewatering and step-back measures, but neither individual recalls the source of such information.

The Land Manager remembers the following:

One of the specific items you asked for regarding the tailings impoundment was information that was used as a basis of justification for the purchase of the homes and property near the southeast corner of the impoundment. I was asked in 1988 to read through a technical report prepared by an engineering firm by the name of 'Klohn Leonoff' regarding the stability analysis work they had conducted upon the tailings impoundment. This report was considered highly confidential and was taken back by R.K. Davey after I had reviewed it. Therefore,

I cannot provide any information, other than speculation, as to why management decided to purchase and later sell the subject homes.

App. H. Presumably, the answer to this enigma is that management had decided not to implement the KL mitigation recommendations, and to rely on the dewatering effort to protect persons and property in the projected spill-out area.

Prior Legal Reviews: Shortly after publication of the initial KL Geotechnical Evaluation of the Tailings Impoundment in 1988, a legal review was commissioned by Messrs. Joklik and Bernhisel through the then General Counsel, Earl Tingey. They were seeking an opinion regarding the exposure associated with a failure, especially at the Magna Corner, and appropriate measures to mitigate any contingent liabilities. Although Mr. Tingey retained Bob Connery of the Holland and Hart firm in Denver to undertake the investigation, Mr. Connery's review was closely controlled, managed and monitored by Messrs. Joklik and Bernhisel, with Tingey's role merely being an information conduit.

Upon his retention, Mr. Connery reviewed the KL reports and decided to seek a second opinion from a world renowned expert, Dr. H. Bolton Seed, a professor at U.C. Berkeley. Dr. Seed validated KL's methodology, techniques and findings. Although he did not recommend the immediate evacuation of the residents within the spill-out area, he confirmed the high level of risk, and advised the company to implement mitigating measures in a timely manner.

Based on his review of the KL studies and Dr. Seed's advice, Mr. Connery concluded in 1989 as follows:

The very serious liabilities that could be involved in the tailings impoundment matter have to do with punitive damages, long-term damages to individuals and institutions, and even criminal liabilities. I do not mean to be an alarmist about those liabilities, but the only remedy or mitigation for some of them is effective disclosure to those affected on a timely basis once the potential risks become clear.

App. D. Frank Joklik disagreed with this advice, and requested Mr. Connery to transmit his internal memoranda to Kennecott and to destroy any copies. "Frank Joklik felt that disclosure to people in the failure flow areas would cause panic and suits when the risk really did not warrant moving people in Professor Seed's opinion." Mr. Joklik also requested Mr. Connery to put the KL reports under the protection of the attorney work product privilege, and was advised that such protection was unavailable because the reports were not commissioned by counsel in anticipation of litigation.

Messrs. Joklik and Bernhisel effectively terminated Mr. Connery's engagement without articulating the reasons. He was subsequently told that Mr. Joklik did not "like" his advice. However, he also was erroneously lead to believe that his recommendations had been implemented, the public notified, and mitigating measures undertaken as suggested in the KL studies. Interestingly, management prepared, or had prepared, a draft 1989 press release setting forth the risk and the company's mitigation effort, but it was never released to the public. App. I. Despite Messrs. Joklik's and Bernhisel's instructions to destroy records, Mr. Connery preserved all correspondence and memoranda relating to his engagement.

Sometime after Mr. Connery's termination, Kennecott's General Counsel solicited a second legal opinion from Parsons, Behle & Latimer. PB&L produced a draft opinion dated October 9, 1997 for review and comment by Kennecott's management. The General Counsel requested a verbal report, and instructed PB&L not to convey the firm's written opinion to Kennecott. After PB&L lawyers presented their findings and conclusions to the General Counsel, he indicated that Mr. Joklik would terminate PB&L's representation if their opinion was rendered to him, and he instructed PB&L to destroy the opinion. PB&L had no further involvement in the matter, but nevertheless preserved the October 9, 1990 draft opinion. App. J.

The draft opinion is unequivocal in its advice to Kennecott's management:

Because we have concluded the tailings pond is unreasonably dangerous, we are also of the opinion that Kennecott has the legal duty to take the following further actions: First, Kennecott should warn the general public (i.e., the people who live, work, or travel in the area of potential danger) of the possibility of the tailings pond being destroyed by a severe earthquake. Second, Kennecott should also take whatever further remedial steps that may be necessary to make the tailings pond reasonably safe. Assuming (as we understand to be the case) that it is not feasible or practical to strengthen the tailings pond so that it would likely survive a 7.5 earthquake, then we believe Kennecott has a legal duty to take appropriate steps designed to prevent people and their property from being injured or damaged in the event that the tailings pond is destroyed by a severe earthquake. In our view, these steps should include the creation of a buffer zone around the tailings pond and relocation of Highway 201.

PB&L goes on to explain that Kennecott, and its management, will be exposed to punitive and criminal sanctions if the company fails to warn the public of the danger and to expeditiously implement mitigating measures, including the creation of a buffer zone. Other than the 1990 verbal report to the General Counsel, there is no indication in the record that PB&L's findings and conclusions were ever transmitted to Kennecott's management.

Woodward Clyde Studies: After management decided in 1993 to abandon the berm, buffer and dike components of the Magna Corner seismic upgrade, the step-backs and the dewatering effort became the key elements of Kennecott's program to stabilize the southern reaches of the impoundment. Conversely, the ambitious and costly modernization project effectively stabilizes the northern reaches while providing significantly enhanced storage capacity. During the process of permitting the modernization, Woodward Clyde (WC) was retained to conduct a comprehensive "Seismic Hazard Evaluation," which included a reassessment of the risk associated with the Magna Corner.

During the interim between the KL studies and WC's evaluation, the State Engineer promulgated dam safety standards for existing structures. Although there is some question regarding the applicability of the standards to tailings impoundments, the general consensus, and the State Engineer's position, is that Kennecott's facility must meet the minimum requirements. Recognizing the variations in seismic hazards based on location and faulting, the regulations do not set forth an objective standard for seismic stability. Rather, the regulations require owners and operators of water impoundments to conduct extensive geotechnical studies and to ensure their facilities are reasonably capable of withstanding both the Maximum Credible Earthquake (MCE) and the Operating Basis Earthquake (OBE). App. K.

WC finalized the Seismic Hazard Evaluation in August of 1994. The Evaluation established the MCE for the Impoundment as a 7 event on the Mercalli scale, and the OBE as a 6.5 event on the Mercalli scale. The Evaluation determined that the risk of liquefaction at the Magna Corner, under MCE conditions, was 7% over a 50 year period. This risk is roughly equivalent to the 6% risk over a 30 year period postulated in KL's Reduction Report. However, KL subsequently reduced the risk from 6% to 5% in a May 1991 study examining the feasibility of mitigation through the establishment of a buffer zone. App. T. Thus, WC determined the risk had increased, despite approximately four years of dewatering, and a reduction in the assumed magnitude of the MCE from 7.5 to 7.

WC currently is evaluating the efficacy of the dewatering and step-back program and has set forth preliminary findings that the dewatering effort has already reinforced the southern reach of the Magna Corner to withstand the OBE, and will be sufficiently stable to withstand the MCE in the year 2018, assuming the continuation of the seismic upgrade dewatering program. WC does not believe the eastern side of the southern reach can be sufficiently upgraded by dewatering due to the deposition of fine tailings, and they recommend the construction of a stabilizing berm. App. L. The status of the WC review of the "Southeast Corner Seismic Upgrade" is outlined in the Kennecott Management Briefing of June, 1997 entitled "Kennecott Existing Magna Tailings Impoundment Geotechnical Status Report." App. A. Although WC's report was expected to be finalized on or about October 15, 1997, problems at the Northeast corner have delayed completion of the geotechnical review.

State Engineer Involvement: After the initial KL reports were provided to Kennecott, management met with the State Engineer and shared the KL findings regarding the seismic instability of the impoundment. The discussions with the State Engineer are memorialized in minutes of the meetings, prepared by Kennecott, but not reviewed and approved by the State Engineer. App. M. The minutes reflect that the State Engineer approved of Kennecott's seismic upgrade efforts, and the general status of the impoundment. The minutes further indicate that the KL studies were shared with the State Engineer, but were not retained in the agency records because of concerns "that they would fall into the public domain." The State Engineer provided informal assurances that he had "no intention ... of going public with the information." The Project Manager advises that the State Engineer has not retained copies of any of the geotechnical reports generated on behalf of Kennecott, and the only document available to the public through the State Engineer's office is the design report for the north expansion.

Analysis & Conclusions

The record inherited from prior management regarding Kennecott's response to the KL findings and recommendations is clearly unfavorable. Prior management's decisions to disregard and conceal legal advice, forego public notice, attempt to establish a residential buffer surreptitiously, collude with the State Engineer to withhold the KL studies from the public, and restrict the distribution of the Reduction Study, collectively and individually, give the appearance of a conspiracy to cover-up a profound threat to public safety. Moreover, the decision to abandon the berm, buffer and dike components of the seismic upgrade is not well documented and seems to have been motivated by economics, with no genuine concern for public safety. If the impoundment were to fail under existing circumstances, the company, and responsible members of management, would be subject to enormous civil liability, coupled with significant punitive and criminal sanctions, especially if persons within the spill-out zone were to incur serious bodily harm or death.

The lack of public notice is particularly puzzling. Contrary to the unequivocal advice of two highly regarded law firms, Kennecott's management did not provide the requisite warning because Mr. Joklik believed it would cause "panic and suits." Even assuming Mr. Joklik was correct in this assumption, the public has a right to know of the hazard, and Kennecott has a legal and moral duty to disclose the risk and advise potentially affected persons of the company's mitigation effort. The possibility of a public backlash suggests that the data is, in fact, sufficiently important to the average citizenry to justify voluntary disclosure. A coordinated public relations effort is certainly preferable to the very real possibility that a disgruntled present or former Kennecott employee will decide to disclose the facts to the press or public in a negative or inflammatory manner. Any resulting litigation against Kennecott would include an allegation of deliberate corporate concealment of a known risk to life, limb and property.

Recent Kennecott management has taken comfort in the fact that public disclosure arguably has been accomplished in presentations before the Magna Community Council and by submitting the Woodward Clyde studies to the Army Corp of Engineers as part of the Tailings Modernization Environmental Impact Study. Unfortunately, the Magna Community Council meetings are poorly attended, and receive very little coverage from the main stream press. The presentations were verbal, and there is no indication that explicit notice of the risk was provided in the manner suggested by legal counsel. With respect to the EIS, it is a huge document which most members of the public were unlikely to review in detail unless they had a specific, identifiable interest in the area impacted by the Modernization Project. The public comments received by the Army Corp support this conclusion.

If, as Messrs. Pierce and Priano contend, the risk had been mitigated and proper disclosure made to the public, then why was it necessary in 1995 to continue the subterfuge associated with the use of an undisclosed agent in the sale of the Green Meadow Estates homes to unsuspecting members of the general public? The acquisition program suggests that the company considered the risk to be sufficiently great to justify relocation of families living within the spill-out area, and in the absence of conclusive evidence that the risk had been mitigated, the subsequent sale implies a callous disregard of the safety and well-being of the new residents. The failure to disclose such risk to the purchasers could, under certain circumstances, be considered a form of fraud under Utah law. App. O.

The potential for misinterpretation of the RTZ 1992 Risk Assessment questionnaire is chilling. Just prior to the 1993 decision to forgo construction of a berm, RTZ commissioned a census of the men, women and children living in the inundation zone identified by KL, and requested Kennecott management to determine the "approximate value placed on loss of life by Utah courts, with variation by age." Although there is no apparent link between the assessment and the decision not to construct the berm, a skillful trial lawyer would argue the connection is obvious. The company decided human life was not worth the cost of completing the seismic upgrade in the manner most likely to yield an acceptable margin of safety. Was the RTZ risk management group truly interested in the monetary value of a child's life in Magna, Utah? If so, why? App. P.

The 1993 decision to abandon major components of the seismic upgrade program poses a dilemma for Kennecott's current management. The decision appears to have been premised on the high cost and administrative burden associated with construction of a substantial berm, acquisition of a large buffer area, relocation of public facilities, and installation of a deflection dike. The possibility of stabilizing the Magna Corner exclusively through the dewatering effort appears to be a post-decision attempt to provide a supporting rationale, by identifying a viable method of protecting against the potentially devastating effects of a seismic failure. Unfortunately, the dewatering option continues to be unproven, and there is dissent within the company

against the decision to forgo the berm, buffer and dike components of the seismic upgrade program.

In a recent interview, Mr. Zip Zavodni, Kennecott's Manager of Geotechnical Engineering, responded to queries as follows:

Q So, once the Klohn Leonoff report was issued ... did you begin to form any opinions or judgments as to what, if anything, the company ought to do in response ... ?

A You bet.

Q What were those opinions and judgments?

A Well, I felt that we obviously had to do something to the southeast corner.

Q And what was it you thought ought to be done ... ?

A The first thing that comes to mind ... is to shield that roadway, remove it, raise it is the first gut reaction that came to mind.

Q You mean Highway 201?

A Yes.

Q What about the residential areas?

A Well, obviously that comes to mind right after that. The best way is to move the people out of there.

Q The company considered the possibility of creating a buffer zone and/or a barrier. Neither of those things are done?

A Well, I think the buffer zone was definitely started.

Q Did you know we have sold most of those properties back to members of the public?

A I heard that and I couldn't believe it.

Q Why couldn't you believe it?

A Well, I think the exposure is still there and I don't understand why we are selling back to the public.

Q In your judgment, given the efforts we have made, the step-backs, the drains, the decant pond, and the other measures, do you think that those measures are sufficient to have eliminated the need for a barrier and for a buffer zone?

A No.

Mr. Zavodni further opined that the on-going Woodward Clyde dewatering study was speculative: "I don't think we have a very good feel at the moment how well we are going to be able to dewater this embankment over the next 20 years. We have thrown our best models at it, and those models are indicating roughly what they are telling us, but those models could be wrong." App. Q. Mr. Zavodni's current position is consistent with the advice he rendered to Mr. Joklik in an October 18, 1989 memorandum indicating dewatering alone would only reduce the risk of liquefaction by 20% through the year 2000, compared to a 100% reduction with construction of a berm in addition to dewatering. App. R.

Despite Mr. Zavodni's misgivings, management's existing options have been restricted by the 1993 decision to forgo the berm, buffer and dike elements of the seismic upgrade. Even if present day management were differently inclined, completion of the project as designed would require nearly a decade. Although current data indicates the dewatering program will not achieve stability until 2018, the risk will persist through 2007 even if management were to reverse the 1993 decision immediately. Improvements in the dewatering program, and the development of additional data since 1989, have enabled Woodward Clyde to alter Klohn Leonoff's conclusion that dewatering alone will never provide the requisite stability on the southern embankment. Management may reasonably conclude that similar advances over the next decade could solve the problem without the necessity of constructing a berm.

Conversely, the berm, buffer and dike design completed in 1993 may have been overly ambitious in light of existing data establishing the effectiveness of the dewatering program. This fact is recognized in KL's 1992 draft "Assessment of Vertical Pumping Wells." KL concludes that "for the predicted 10-year phreatic level, the footprint of the required berm to meet a factor of Safety of 1.2 is reduced from 560 ft to 248 ft, a 55% reduction. The corresponding volume of the berm fill material is reduced by 77%." App. N. Depending on the results of the on-going Woodward Clyde study, management may reasonably conclude that a cheaper, smaller berm is feasible, and will achieve an acceptable margin of safety in a shorter period of time.

Kennecott also will have difficulties ensuring the safety of Magna residents, and other members of the public, through the establishment of a buffer zone. In addition to the

runout estimates set forth in the 1989 Reduction Study (1/2 mile to the south) which was based on an embankment height of 160 feet, KL issued a runout estimate on November 7, 1991 which places most of Magna in the spill zone assuming a 200 hundred foot embankment. The current height is approximately 220 feet. The study sets forth a qualification that "it would not be unreasonable to expect that the actual runout distances could vary by as much as a factor of two or more from those estimated." App. S. Although Woodward Clyde issued a more conservative "Inundation Technical Memorandum" in September of 1994, the "art" of estimating potential runout distances is unreliable, and provides little guidance in ascertaining the nature and scope of an appropriate buffer zone in the absence of a berm and deflection dike. App. U.

In a 1991 study entitled "Risk Reduction-Southeast Corner-Assessment of Buffer Zone Option," KL concluded that a buffer zone would not provide an adequate degree of protection in the absence of a berm and deflection dike. KL stated that "the designation of a buffer zone has no precedent (to our knowledge) and has the complex considerations of land use within the zone, as well as the risk of unknowns with such an application." App. T. Stated simply, a buffer zone would not be certain of success unless Kennecott is willing to relocate the entire town of Magna and to re-route Highway 201 through a pass in the Oquirrh Mountains. This problem was enhanced by the necessity of raising the embankment an additional 60 feet after publication of the KL studies. Although there is general consensus that the raises did not further impair stability, there also is agreement that they increased the potential runout area.

Management nevertheless should be aware of the fact that this report is not intended to evaluate the existing technical options pertaining to the seismic instability of the Magna Corner. Rather, this report is intended to advise management regarding an appropriate course of action given the limitations imposed by historical decision-making. Management should carefully review all of the existing options and determine the most prudent strategy. If management elects to pursue the current dewatering program without implementing other mitigating measures, then the rationale for such a decision should be clearly articulated, especially in the context of public safety. Although existing management cannot alter the past, the record may require clarification to avoid misinterpretation which could adversely impact the company's reputation, and in the event of a significant failure, the company's future economic viability.

Management should seek consensus among the geotechnical experts, inside and outside the company, regarding the viability of the dewatering program as opposed to the berm, buffer and dike alternative. The final conclusions of the on-going Woodward Clyde study should be carefully reviewed and critiqued before they are used in the decision-making process. If, after undertaking due diligence procedures, consensus is not possible, then management should set forth credible explanations for

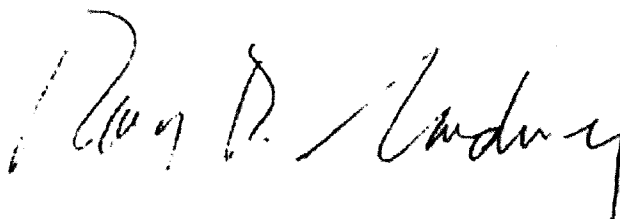
adopting a position contrary to dissenting viewpoints. Most importantly, management must place the public interest before economic considerations in deciding issues involving the possibility of fatalities or serious bodily injuries.

The best example of this principle is found in Ford Motor Company's experience with the Pinto. In the early 1970's, Ford Motor Company engineered, produced and sold an economy car called the Pinto. During the engineering phase, a safety hazard was identified in the design and location of the fuel tank. Ford's management concluded that the unit cost of moving the tanks exceeded the anticipated expense of defending lawsuits and paying claims. This decision was memorialized in Ford's business records, which estimated a cost of \$49.5 million to settle burn claims, compared with \$137 million to correct the design flaw. When three girls burned to death in a Pinto, an Indiana prosecutor brought criminal charges against Ford. Although the company was acquitted, civil juries around the country awarded millions of dollars in punitive damages to the victims of Pinto automobiles. Although the record in this matter is not as egregious, it nevertheless is analogous to the Pinto cases, and should be duly considered and addressed by Kennecott's existing management.

Recommendations

1. Notify the public of the risk associated with a seismic failure of the Magna Corner and Kennecott's on-going effort to mitigate the risk. The notice should be in the form of a press release and should be sent by mail to the residences, businesses and public facilities identified in the Woodward Clyde Inundation Technical Memorandum, or an updated version thereof. Public Relations professionals should assist in the notification process.
2. Undertake a comprehensive due diligence investigation of KUCC's mitigation options. The investigation should initially involve a detailed review of all studies and records relating to the seismic stability of the Magna Corner from 1988 to the present. After completing the document review, the investigators should solicit the views of technical experts involved in the matter, including employees and consultants. The investigation should consider the final conclusions of the on-going Woodward-Clyde study. The due diligence process may be undertaken by a committee appointed by the CEO; provided the Chief Legal Officer oversees the committee's activities.
3. Upon conclusion of the due diligence process, the committee should issue a report to the Chief Legal Officer, setting forth appropriate findings and recommendations. The report also should clarify the record, to the extent practicable, pertaining to historical decision-making. After appropriate legal review, the report should be transmitted by the committee to the CEO. The CEO should act on the report, and memorialize, in writing, the rationales supporting his decisions.

The legal authorities and precedents supporting applicable analyses, conclusions and recommendations are not referenced in this report. Relevant legal points and authorities are available upon request, and are partially set forth in the PB&L draft opinion dated October 9, 1990. In addition, several past and present employees were not interviewed during the investigation. The committee should consult with the Chief Legal Officer for recommendations concerning the possible expansion of the investigation to include querying additional persons who may have knowledge of the matters set forth herein.

A handwritten signature in dark ink, appearing to read "R. D. Gardner". The signature is fluid and cursive, with a large initial "R" and a long, sweeping underline.

R. D. Gardner